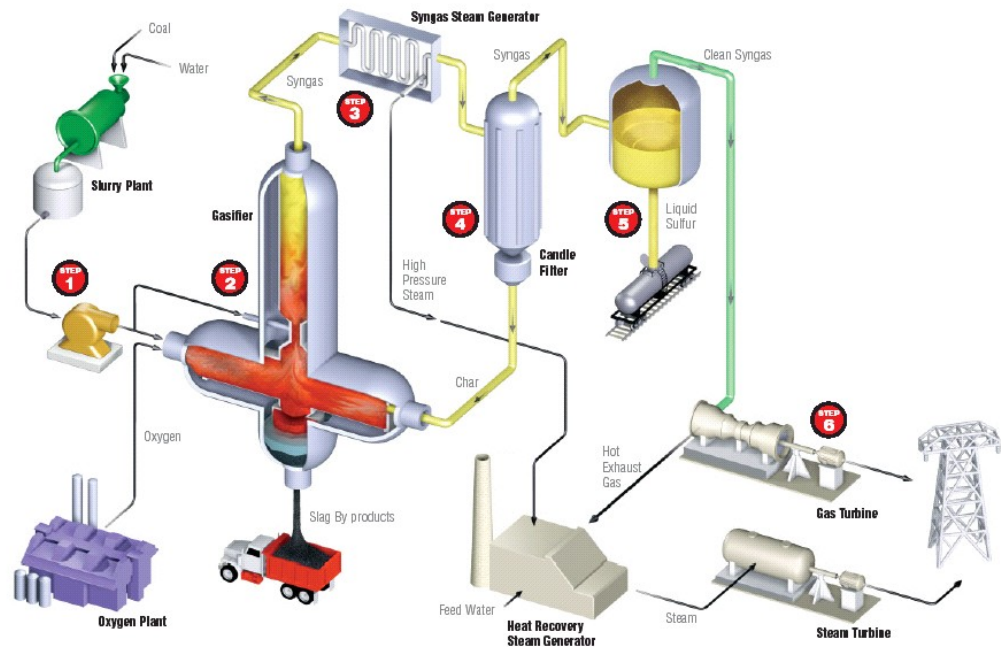


# Excelsior Energy, Inc.

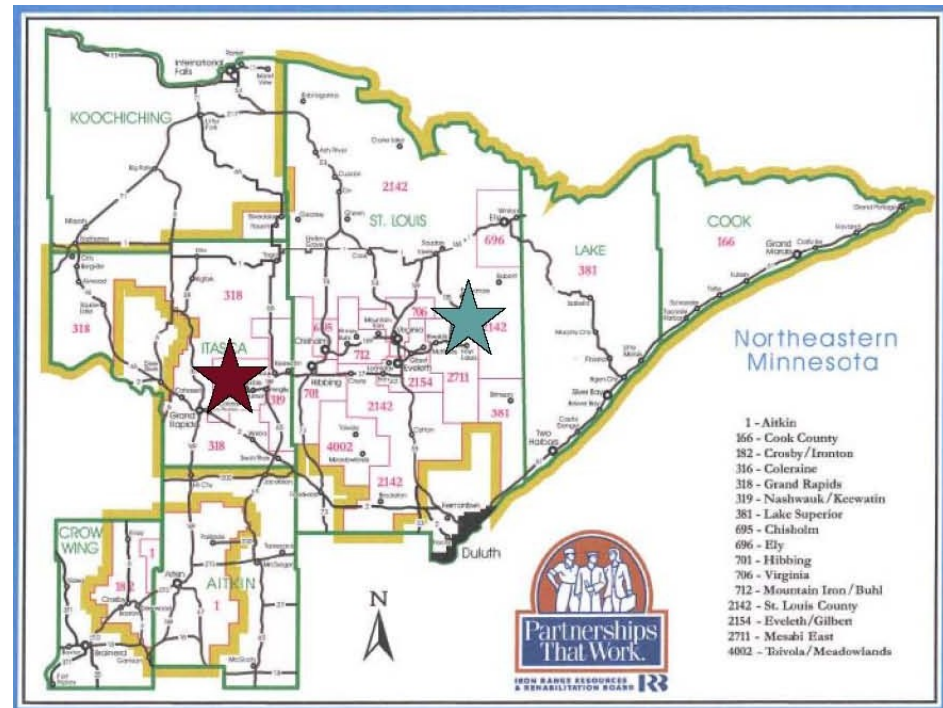
- Next-generation utility-scale Integrated Gasification Combined Cycle (IGCC) using ConocoPhillips' E-Gas™ carbonaceous solids gasification technology
- Demonstration to be built in Iron Range of northern Minnesota.
- Achieving higher plant efficiencies and availability, lower emissions (including mercury), fuel flexibility & by-product marketability
- Total Project Costs: \$1.97 Billion (DOE Share: \$36 Million).
- Projected operational in 2011, producing up to 600 MWe (net).



## A CCPI Round 2 Project

## Background

- Mesaba Energy Project (“Mesaba”) is Phase I of a two phase nominal 1200 MWe power complex.
- Preferred Project Location – Greenfield near Taconite, MN
  - About 70 miles northwest of Duluth
- Alternate Project Location – Brownfield near Hoyt Lakes, MN
  - About 50 miles north of Duluth
- Multiple feedstock options
- Transportation options
  - Shipping
  - Trucking
  - Rail
- Water access
  - Abandoned iron mine pits



# – Background

- **Proposed Recipient Team members include:**

- Recipient: Excelsior Energy, Inc., an independent energy management company (Minnetonka, MN)
- EPC: Fluor Enterprises (Aliso Viejo, CA)
- Technology Rights Holder: ConocoPhillips (Houston, TX)

- **Fuel**

- Sub-Bituminous Coal (Wyoming Powder River Basin)
- Bituminous Coal (Illinois Basin No. 6)
- Petroleum Coke Blends

- **The Mesaba project will improve commercial IGCC performance by drawing upon:**

- DOE-funded studies of potential performance & technology advancements
- 1600 operational lessons learned from 8-years of hands-on experience at the DOE CCT Wabash River Coal Gasification Repowering Project in Terre Haute, IN (Wabash River).



# – Technology Uniqueness

- **Enhanced/refined ConocoPhillips E-Gas™ carbonaceous solids gasification technology (based on success at Wabash River)**
  - Full-Slurry Quench (FSQ), multiple-train gasifier system
  - Operational Availability of about 90% or better (vs. 77% for Wabash River)
- **Integrated Air Separation Unit – Gas Turbine (first in U.S.)**
  - Extract bleed air from gas turbine to reduce parasitic load of main air compressor in ASU
  - Recycle nitrogen from ASU and inject into gas turbine to reduce NO<sub>x</sub> and combustor flame temperature
- **Environmental**
  - Demonstrate emission levels for criteria pollutants (SO<sub>2</sub>, NO<sub>x</sub>, CO, volatile organic compounds and particulate matter) and mercury equal to or below those now considered to represent the lowest emission rates for utility-scale, coal-based generation (using similar feedstocks)
  - Demonstrate CO<sub>2</sub> emissions 15% to 20% lower than the current average for U.S. coal-based power plants (using similar feedstocks); Sequestration adaptable
- **Thermal Efficiency – design heat rate of about 8,600 Btu/kW-hr (bituminous coal)**



## **Schedule**

- **Project Start** – A cooperative agreement representing the start of the project is expected in 1<sup>st</sup> Qtr FY2006.
- **NEPA Process** – Started June 8, 2005, with an expected NEPA completion date of November 2006.
- **Design** – Completed in 2008.
- **Construction** – Expected to start in 2008, with a duration of 42 months .
- **Operations** – Demonstration phase to begin 2011 for 12 months
- **Project Complete** – Cooperative agreement end in 2012.



## – Potential Benefits

- **Flexibility to process both high- and low-rank coals into a clean synthesis gas containing hydrogen**
  - Also petroleum coke (which may have a negative economic value)
- **Carbon Dioxide emissions:**
  - 15% to 20% lower than the current average for U.S. coal-based power plants (using similar feedstocks)
  - Sequestration adaptable with retrofit for capture, if greenhouse gas reductions are imposed by future regulations
- **Emissions equal to or below those now considered the lowest rates for utility-scale, coal-based generation (using similar feedstocks)**
- **Commercial reference plant for IGCC**
  - Standard replicable design configuration
  - Sound basis for installed costs
  - Competitive commercial and regulatory framework



## – Potential Benefits

- Will help maintain the Nation's abundant coal resources as a cornerstone of our future domestic energy portfolio for power generation
- Technological successes from the demonstration will further the President's national environmental objectives:
  - Clear Skies Initiative
  - Global Climate Change Initiative
  - FutureGen
  - Hydrogen Initiative

